

# Acoustic Cooling

U N I V E R S I T Y O F U T A H  
CENTER

The Center for Acoustic Cooling Technologies was originally established to commercialize novel high frequency thermoacoustic engines for cooling applications. One important application for this technology is in the heat management of computers and other devices employing dense arrays of microcircuits. Subsequent work has resulted in the demonstration of a prototype device capable of converting heat into electricity at high efficiency.

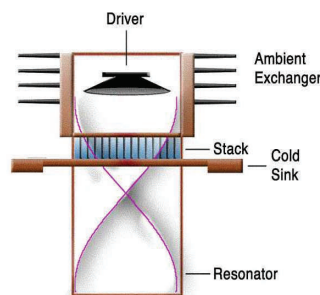
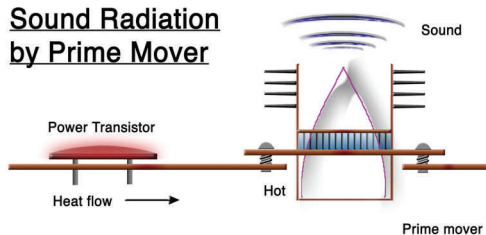
## TECHNOLOGY

The Center for Acoustic Cooling is leveraging fundamental developments in miniature thermo-acoustic devices supported by the Office of Naval Research and DARPA. The Center's technology is based on two effects in thermo acoustics: The first is that heat can be converted into sound energy, and the second is that sound can pump heat. Both have been employed in devices with dimensions ranging from 4 cm to 0.8 cm. Piezoelectric materials have now been incorporated in order to recover electricity in some cases.

## ACCOMPLISHMENTS

Prototype devices have been constructed and successfully demonstrated by an independent company. The last year has seen more successful miniaturization and improved heat transfer, which is the limiting factor for cooling power. Prototype heat to sound to electricity converters have been built and tested with efficiency ranging from 10-25% at a temperature difference of 50 C.

### Sound Radiation by Prime Mover



## THINK TANK

What if there was...

**A miniature cooling device with no moving parts and using sound as its main energy source, that could replace the fans in desktop computers and other devices and appliances?**



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